

CLAIMS

What is Claimed is:

1. A body painting method for simultaneously creating a plurality of patterns,
5 which employs a specialized computer-controlled body-painting machine to print
the body-painting patterns, comprising the following basic steps:

(1) Opening a plurality of pictures used for body paintings simultaneously
in a computer;

(2) Placing objects having a plurality of parts to be painted onto a
10 corresponding clamp, and holding each part within the printing area of a printing
device by means of the clamp;

(3) Determining the location of each part by a camera and displaying them
on a display of the computer, and adjusting the size and printing location of each
opened picture through the computer so that the size of each picture is equal to or
15 larger than the size of its respective body part to be painted while the printing
location of each picture is positioned at said respective body part;

(4) Starting the printing device by the computer so that all pictures are
printed as one pattern by the printing device, while each picture is printed right
onto its respective body part.

2. The body painting method for simultaneously creating a plurality of patterns
20 according to claim 1, characterized in that a preprocess for the body parts to be
painted can be performed according to the properties of different body parts so as
to meet the requirements of printing and human body protection; and a
post-process can also be performed upon completion of printing so as to meet the
25 requirements of aesthetics and protection of the printed patterns.

3. The body painting method for simultaneously creating a plurality of patterns according to claim 2, characterized in that said step (3) includes following steps: taking a static photo illustrating the location of each body part to be printed by the camera; displaying these static photos on the bottom layer of the adjusting
5 working area for the opened pictures of the display of the computer; adjusting each of the opened pictures on the display to respective position which corresponds to painting body part; presenting each picture on the display semi-transparently so that the profile of the nail beneath the picture can be seen clearly; adjusting the size of each picture so that it is slightly larger than that of
10 the painting body part; and then drawing a profile line of the painting location; removing the pixels of the picture beyond the profile so that the edges of the picture overlap the edges of the nail.

4. The body painting method for simultaneously creating a plurality of patterns according to claim 2, characterized in that said preprocess further includes the
15 step of applying a coating that can be readily washed off to the surrounding of the painting body part; and the size of each picture is adjusted in step (3) so that it is slightly larger than that of the painting body part, and those parts of the body-painting pattern outside the painting body part are then erased using suitable detergents after printing.

20 5. The body painting method for simultaneously creating a plurality of patterns according to claims 3 or 4, characterized in that the fingernails can be divided into two groups according to the following two modes during the painting process, and all the fingernails are preprocessed before printing and are post-processed after printing:

25 Mode 1: All the four fingers except for the thumb of one hand and the thumb

of the other hand are placed in one group, and the other five fingers are placed in another group;

Mode 2: The eight fingers of both hands except for the two thumbs are placed together to be a group, and the two thumbs are to be another group;

- 5 6. A computer-controlled body-painting machine for simultaneously creating a plurality of patterns, characterized in that the machine comprises a computer, a printing device, a camera, a longitudinal moving mechanism, a transverse moving mechanism, a clamp and a machine body, wherein said computer is electrically connected to the printing device and the camera, the machine body is
- 10 mainly composed of an upper casing and a base, the upper casing locates above the base, the printing device mainly comprises a printing head which forms a moving member of the transverse moving mechanism or is fixedly mounted on a moving member of the transverse moving mechanism, the transverse move mechanism comprises a fixed member, a moving member and a moving member
- 15 driving means, the fixed member of which is connected to a moving member of the longitudinal moving mechanism, the longitudinal moving mechanism comprises a fixed member, a moving member and a moving member driving means, the fixed member of which is connected to the upper part of the inner space of the upper casing, the camera mainly comprises a camera head which is
- 20 positioned above the printing head, and is arranged in such way that the shooting direction thereof facing downward and the shooting area covers the printing area of the printing head, there is provided with a space between the upper casing and the base to receive the clamp, the front side of the space is opened, the clamp is movably disposed within the space for receiving the same therein between the
- 25 upper casing and the base, the position of the painting body part determined by

which is located within the printing area.

7. The computer-controlled body-painting machine for simultaneously creating a plurality of patterns according to claim 6, characterized in that the base is a case body and is positioned at the lower portion of the whole device, whose upper plate assumes a U shape when viewing from the front, the mainframe of the computer is disposed inside the case body of the base; the upper casing is a case body, whose bottom plate assumes a invert U shape when viewing from the front; there is a square hole formed on the concave surface of the bottom plate, two longitudinal sliding grooves are formed respectively at the upper parts of the two side walls of the concave of the bottom plate, the concave space of the upper plate of the base and the concave space of the bottom plate of the upper casing are interconnected face-to-face so as to form the space for receiving the clamp; the printing device, the camera, the longitudinal moving mechanism, the transverse moving mechanism are all disposed inside the case body of the upper casing, and the printing plane of the printing head is positioned at the square hole of the bottom plate of the upper casing; the fixed member of the transverse moving mechanism can mainly comprise a printing bracket and one transverse sliding bar, the left and right ends of said printing bracket is provided with a protecting and cleaning device for the printing head, the transverse sliding bar is positioned below the main portion of the printing bracket with its two ends fixedly connected to the downwardly extended portions of the left and right sides of the printing bracket respectively, and the printing head is movably mounted on the transverse sliding bar thereby forming the moving member of the transverse moving mechanism; the driving means of the transverse moving mechanism comprises a transverse movement driving motor and a transverse movement belt

transmission means, the output shaft of the transverse movement driving motor is fixedly connected to the driving wheel of the belt transmission means, and the driving wheel and driven wheel of the transverse movement belt transmission means are mounted to the downwardly extended portions of the left and right
5 sides of the printing bracket respectively, the printing head is fixedly connected to the transmission belt of the transverse movement belt transmission means; the camera head is mounted on the suspending plate or on the inner side of the upper plate of the upper casing directly or by means of a mounting bracket, and is provided with a light emitter and a control circuit for control of the light emitter,
10 the light emitter and the control circuit for control of the light emitter is disposed above the camera head, and is mounted on the suspending plate above the working area of the printing head by a regulating board .

8. The computer-controlled body-painting machine for simultaneously creating a plurality of patterns according to claim 7, characterized in that the
15 fixed member of the longitudinal moving mechanism mainly comprises a suspending plate and two longitudinal sliding bars, the suspending plate is in a planar shape, which is positioned at the upper portion of the inner space of the upper casing and is secured to the side wall of the upper casing; the two longitudinal sliding bars are parallel to each other, which are positioned
20 respectively on the left and right sides below the suspending plate and are fixedly connected to the suspending plate by their respective connecting parts; the moving member of the longitudinal moving mechanism mainly comprises two linear bearings and a hanger, the hanger is located below the two longitudinal sliding bars and the two linear bearings are movably mounted on the two
25 longitudinal sliding bars respectively and are fixedly connected to the hanger by

their respective fixed brackets; the moving member driving means of the longitudinal moving mechanism comprises a step motor and two longitudinal belt transmission means, each of the two linear bearings is fixedly connected to its corresponding transmission belt of the longitudinal belt transmission means, 5 the step motor is connected to the driving wheels of the two longitudinal belt transmission means by a transverse belt transmission means, the transverse belt transmission means is provided with a driving wheel and two driven wheels, the two driven wheels of the transverse belt transmission means may be respectively coaxial with the driving wheels of the two longitudinal belt transmission means 10 or directly employ the driving wheels of the two longitudinal belt transmission means, the driving wheel of the transverse belt transmission means is connected to the output shaft of the step motor, and the transmission belt is in T shape with the inner end of its longitudinal portion located at the center of its transverse portion, two driven wheels of the transverse belt transmission means are 15 provided at the two ends of the transverse portion of its transmission belt, a driving wheel is provided at the outer end of the longitudinal portion of said transmission belt and two driven tightening wheels for tightening the transmission belt are also provided at the outer side of the inner end of the transverse portion of said belt; the moving member of the transverse moving 20 mechanism, the driving means of the transverse moving mechanism comprises a transverse movement driving motor and a transverse movement belt transmission means, the output shaft of the transverse movement driving motor is fixedly connected to the driving wheel of the transverse movement belt transmission means, and the driving wheel and driven wheel of the transverse movement belt 25 transmission means are mounted to the downwardly extended portions of the left

and right sides of the printing bracket, the printing head is fixedly connected to the transmission belt of the transverse movement belt transmission means.

9. The computer-controlled body-painting machine for simultaneously creating a plurality of patterns according to claim 7, characterized in that the
5 fixed member of the longitudinal moving mechanism mainly comprises a suspending plate and two longitudinal sliding bars, the suspending plate is in a planar shape, which is positioned at the upper portion of the inner space of the upper casing and is secured to the side wall of the upper casing, the two longitudinal sliding bars are parallel to each other which are located respectively
10 on the left and right sides below the suspending plate and are fixedly connected to the suspending plate by their respective connecting parts; the moving member of the longitudinal moving mechanism mainly comprises two linear bearings and a hanger, the hanger is located below the two longitudinal sliding bars and the two linear bearings are movably mounted on the two longitudinal sliding bars
15 respectively and are fixedly connected to the hanger by their respective fixed brackets, the moving member driving means of the longitudinal moving mechanism can also comprises only a step motor and a longitudinal belt transmission means, and is further provided with a regulating wheel for regulating the degree of tension of the transmission belt and a device for tensing
20 the regulating wheel, said moving member driving means is positioned below the center portion of the suspending plate and in the co-direction of the centers of gravity of both the transverse moving mechanism and the printing device, and its transmission belt being connected to the two linear bearings by the common connection portion and connected to the printing bracket by the connecting part;
25 the output shaft of the step motor is connected to the driving wheel of the

longitudinal moving mechanism; the moving member of the transverse moving mechanism, the driving means of the transverse moving mechanism comprises a transverse movement driving motor and a transverse movement belt transmission means, the output shaft of the transverse movement driving motor is fixedly
5 connected to the driving wheel of the transverse movement belt transmission means, and the driving wheel and driven wheel of the transverse movement belt transmission means are mounted to the downwardly extended portions of the left and right sides of the printing bracket, the printing head is fixedly connected to the transmission belt of the transverse movement belt transmission means.

- 10 10. The computer-controlled body-painting machine for simultaneously creating a plurality of patterns according to claims 6, 7, 8, or 9, characterized in that the clamp is a hand holder, the hand holder includes a hand holder casing consisting of an upper plate, side walls and a base; the left and right sides of the upper plate of said hand holder extend outwardly from the connection position between the
15 upper plate with the side walls so as to form two inserting boards cooperative with the sliding grooves on the bottom plate of the upper casing; said left and right inserting boards inserts into the respective sliding grooves; there is a square hole provided at the center of the upper plate of the hand holder, the position of the square hole is corresponding to the working plane of the printing head; a slim
20 hole is provided at the engaging position of the front side wall of the hand holder casing and the upper plate of the hand holder; several guiding rods are distributed on the base of the hand holder casing, each of which is inserted into a spiral spring; the upper portion of each one of the spiral springs extends beyond the height of each one of the guiding rods; a support piece is fixedly connected to
25 the upper end of each spiral spring and the support piece of each spiral spring

can be a whole piece with a piece of elastic sponge laid on it or different supporting pieces independent from each other; a plurality of locking switch devices are further provided on the base of the hand holder, each of which is connected to a corresponding support piece and used for locking the support
5 pieces at suppressing position or releasing them.